

### Multiple Choice Questions

1. What is the chemical reaction between an acid and a base called?
  - ☐ A) Oxidation reaction
  - ☐ B) Neutralization reaction
  - ☐ C) Synthesis reaction
  - ☐ D) Decomposition reaction
2. Which of the following is a characteristic of acids?
  - ☐ A) They taste bitter
  - ☐ B) They turn red litmus blue
  - ☐ C) They turn blue litmus red
  - ☐ D) They are slippery to touch
3. What is the pH of a neutral solution?
  - ☐ A) 5
  - ☐ B) 6
  - ☐ C) 7
  - ☐ D) 8
4. Which acid is commonly found in tomatoes?
  - ☐ A) Citric acid
  - ☐ B) Oxalic acid
  - ☐ C) Lactic acid
  - ☐ D) Hydrochloric acid
5. What type of acid completely dissociates in water?
  - ☐ A) Weak acid
  - ☐ B) Strong acid
  - ☐ C) Base
  - ☐ D) Salt
6. Which of the following is a strong acid?
  - ☐ A) Acetic acid
  - ☐ B) Citric acid
  - ☐ C) Hydrochloric acid (HCl)
  - ☐ D) Formic acid
7. What is the product of a neutralization reaction between an acid and a base?
  - ☐ A) Only salt
  - ☐ B) Only water
  - ☐ C) Salt and water
  - ☐ D) Acid and base
8. Which of the following bases is commonly used in soap?
  - ☐ A) Sodium hydroxide (NaOH)
  - ☐ B) Potassium hydroxide (KOH)
  - ☐ C) Both A and B
  - ☐ D) Calcium hydroxide

9. What is the pH range of the human body?
- ☐ A) 6.0 to 7.0
  - ☐ B) 7.0 to 7.8
  - ☐ C) 8.0 to 9.0
  - ☐ D) 9.0 to 10.0
10. Which salt does not contain water of crystallization?
- ☐ A) Blue vitriol
  - ☐ B) Baking soda
  - ☐ C) Washing soda
  - ☐ D) Gypsum
11. What is the chemical formula for calcium carbonate?
- ☐ A)  $\text{CaO}$
  - ☐ B)  $\text{Ca(OH)}_2$
  - ☐ C)  $\text{CaCO}_3$
  - ☐ D)  $\text{CaCl}_2$
12. Which of the following is a weak acid?
- ☐ A) Hydrochloric acid ( $\text{HCl}$ )
  - ☐ B) Nitric acid ( $\text{HNO}_3$ )
  - ☐ C) Acetic acid ( $\text{CH}_3\text{COOH}$ )
  - ☐ D) Sulfuric acid ( $\text{H}_2\text{SO}_4$ )
13. What happens when zinc metal is treated with a dilute solution of a strong acid?
- ☐ A) A base is formed
  - ☐ B) A salt is formed
  - ☐ C) Hydrogen gas is evolved
  - ☐ D) Oxygen gas is evolved
14. Which of the following is a basic salt?
- ☐ A) Sodium chloride ( $\text{NaCl}$ )
  - ☐ B) Calcium phosphate ( $\text{Ca}_3(\text{PO}_4)_2$ )
  - ☐ C) Sodium carbonate ( $\text{Na}_2\text{CO}_3$ )
  - ☐ D) Copper sulfate ( $\text{CuSO}_4$ )
15. What is the Arrhenius definition of an acid?
- ☐ A) A substance that accepts a proton
  - ☐ B) A substance that donates a proton
  - ☐ C) A substance that releases hydroxide ions
  - ☐ D) A substance that absorbs water
16. Which of the following is an example of a non-metallic oxide that forms an acid when dissolved in water?
- ☐ A) Calcium oxide ( $\text{CaO}$ )
  - ☐ B) Sulfur dioxide ( $\text{SO}_2$ )
  - ☐ C) Iron oxide ( $\text{Fe}_2\text{O}_3$ )
  - ☐ D) Aluminum oxide ( $\text{Al}_2\text{O}_3$ )

17. What is the nature of calcium phosphate?
- ☐ A) Acidic
  - ☐ B) Basic
  - ☐ C) Neutral
  - ☐ D) Amphoteric
18. Which of the following substances turns pH paper yellowish-orange?
- ☐ A) Lemon juice
  - ☐ B) Vinegar
  - ☐ C) Common salt
  - ☐ D) Acidic soil solution
19. What would change the color of pH paper from yellowish-orange to greenish-blue?
- ☐ A) Lemon juice
  - ☐ B) Vinegar
  - ☐ C) Common salt
  - ☐ D) An antacid
20. Which of the following is not a characteristic of bases?
- ☐ A) They taste bitter
  - ☐ B) They turn red litmus blue
  - ☐ C) They are slippery to touch
  - ☐ D) They turn blue litmus red

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#### True/False Questions

1. **True or False:** Acids always turn blue litmus red.
- ☐ **Suggestion:** Acids are known for turning blue litmus red.
2. **True or False:** Bases are slippery to touch.
- ☐ **Suggestion:** Bases often feel soapy or slippery.
3. **True or False:** Neutralization reactions always produce heat.
- ☐ **Suggestion:** Neutralization reactions typically release heat.
4. **True or False:** All salts are neutral.
- ☐ **Suggestion:** Salts formed from strong acids and strong bases are neutral.
5. **True or False:** Hydrochloric acid is a weak acid.
- ☐ **Suggestion:** Hydrochloric acid is a strong acid.
6. **True or False:** The pH of a neutral solution is 7.
- ☐ **Suggestion:** A pH of 7 indicates a neutral solution.
7. **True or False:** Oxalic acid is commonly found in tomatoes.

- **Suggestion:** Citric acid is more commonly associated with tomatoes.
- 8. **True or False:** Calcium phosphate is an acidic salt.
  - **Suggestion:** Calcium phosphate is a basic salt.
- 9. **True or False:** Sodium hydroxide is used in soap making.
  - **Suggestion:** Sodium hydroxide is commonly used in soap production.
- 10. **True or False:** The human body maintains a pH range of 6.0 to 7.0.
  - **Suggestion:** The human body maintains a pH range of 7.0 to 7.8.
- 11. **True or False:** Washing soda contains water of crystallization.
  - **Suggestion:** Washing soda does not contain water of crystallization.
- 12. **True or False:** Acetic acid is a strong acid.
  - **Suggestion:** Acetic acid is a weak acid.
- 13. **True or False:** Zinc reacts with a strong acid to produce oxygen gas.
  - **Suggestion:** Zinc reacts with a strong acid to produce hydrogen gas.
- 14. **True or False:** Sodium carbonate is a neutral salt.
  - **Suggestion:** Sodium carbonate is a basic salt.
- 15. **True or False:** Arrhenius defined an acid as a substance that accepts a proton.
  - **Suggestion:** Arrhenius defined an acid as a substance that donates a proton.

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#### Short Answer Questions

1. **Explain the difference between strong and weak acids.**

**Answer:** Strong acids completely dissociate in water to produce a high concentration of hydrogen ions, while weak acids only partially dissociate, resulting in a lower concentration of hydrogen ions.

2. **Describe the characteristics of bases.**

**Answer:** Bases are substances that taste bitter, feel slippery, and turn red litmus blue. They neutralize acids to form salts and water.

3. **What is the significance of the pH scale?**

**Answer:** The pH scale measures the concentration of hydrogen ions in a solution, with a pH of 7 being neutral, below 7 being acidic, and above 7 being basic.

4. **Explain the process of neutralization between an acid and a base.**

**Answer:** Neutralization occurs when an acid reacts with a base to form a salt and water. This reaction typically releases heat.

5. What are the uses of baking soda and washing soda?

**Answer:** Baking soda (sodium bicarbonate) is used as a mouthwash and deodorant, while washing soda (sodium carbonate) is used for cleaning and removing stains.

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**Fill-in-the-Blank Questions**

1. Acids are substances that \_ a proton in aqueous solutions.

**Answer:**

2. The reaction between an acid and a base to form salt and water is known as a \_ reaction.

**Answer:**

3. Bases are substances that taste \_ and turn red litmus \_.

**Answer:**

4. The pH of a neutral solution is \_.

**Answer:**

5. Hydrochloric acid (HCl) is an example of a \_ acid.

**Answer:**

6. Calcium phosphate is a \_ salt because it is formed from a weak acid and a strong base.

**Answer:**

7. Sodium hydroxide (NaOH) is commonly used in \_ making.

**Answer:**

8. The human body maintains a pH range of \_ to \_.

**Answer:**

9. Washing soda does not contain \_ of crystallization.

**Answer:**

10. Acetic acid is an example of a \_ acid.

**Answer:**

11. Zinc reacts with a strong acid to produce \_ gas.

**Answer:**

12. Sodium carbonate is a \_ salt.

**Answer:**

13. Arrhenius defined an acid as a substance that \_ a proton.

**Answer:**

14. The pH scale measures the concentration of \_ ions in a solution.

**Answer:**

15. Neutralization reactions typically \_ heat.

**Answer:**